

Claims:

1. An assembly of interlaced rods, suitable for use as embedded reinforcement in matrix materials, comprising first, second and third layers of rods,

the rods of each layer being orientated generally parallel to one another,

the second layer being located between the first and third layers,

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the rods of the first and third layers being longitudinally orientated in the same direction, with those of the second layer being longitudinally orientated generally at right angles thereto,

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the rods of the first and third layers being paired such that each nth rod of the first layer, herein designated rod n_1 , is paired with the nth rod of the third layer, herein designated rod n_3 ,

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paired rods of the first and third layers being drawn together under tension by a flexible filament wound between them in a series of runs spaced along the length of the rods of the first and third layers, each such run extending transversely to the longitudinal orientation of the rods,

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rods of the second layer being located generally parallel to and between adjacent transverse runs of filament,

each such transverse run of filament comprising a forward and reverse sinusoidal winding which interlaces rods of the first and third layers,

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the forward sinusoidal winding following the pattern: rod $1_1 \rightarrow 2_3 \rightarrow 3_1 \rightarrow 4_3 \rightarrow \dots$ and then continuing in the reverse sinusoidal winding pattern: ... $4_1 \rightarrow 3_3 \rightarrow 2_1 \rightarrow 1_3$, whereby each pair of rods n_1 and n_3 in the first and third layers is enclosed by and drawn together by a loop of filament formed by the forward and reverse winding patterns.

2. A rod assembly as claimed in claim 1 wherein a single rod of the second layer is located between any adjacent pair of transverse runs of filament.

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3. A rod assembly as claimed in claim 1 wherein more than one rod of the second layer is located between at least one adjacent pair of transverse runs of filament.

10 4. A rod assembly as claimed in any of the preceding claims wherein each transverse run is formed by one continuously wound filament.

5. A rod assembly as claimed in any of claims 1 to 3 wherein all the transverse runs are formed by one and the same continuously wound
15 filament.

6. A rod assembly as claimed in any of the preceding claims wherein the filament is in the form of a wire, a monofilament, or a multifilament string or rope.

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7. A rod assembly as claimed in any of claims 1 to 5 wherein the filament comprises carbon fibre.

8. A rod assembly as claimed in any of the preceding claims wherein at
25 least some of the rods are of steel or of fibre-filled resin.

9. A rod assembly as claimed in any of claims 1 to 7 wherein at least some of the rods are of glass fibre-filled resin

30 10. A rod assembly as claimed in any of the preceding claims which is embedded in matrix material.

11. A rod assembly embedded in matrix material as claimed in claim 10 wherein the matrix material is a synthetic polymer.

12. A rod assembly embedded in matrix material as claimed in claim 10 or
claim 11 wherein the matrix material has additional plate or rod reinforcement
embedded or partially therein in spaced or contiguous layered relationship to
5 the rod assembly.
13. A rod assembly embedded in matrix material as claimed in any of
claims 10 to 12 wherein the matrix has a flexible sheet material embedded or
10 partially embedded therein in spaced or contiguous layered relationship to the
rod assembly.
14. A rod assembly embedded in matrix material as claimed in claim 13
wherein the flexible sheet material is a woven mat of aramid fibre.
15. 15. A rod assembly embedded in matrix material as claimed in any of
claims 10 to 14 which is laminated as a backing to blast- or ballistic impact-
resistant armour.
16. A rod assembly embedded in matrix material as claimed in any of
20 claims 10 to 14 which is laminated as a backing to blast- or ballistic impact-
resistant armour comprising contiguous cells filled with matrix material.
17. A rod assembly embedded in matrix material as claimed in any of
claims 10 to 14 which is laminated to a backing mass which crushes or
25 deforms progressively under impact.
18. A rod assembly embedded in matrix material as claimed in claim 17
wherein the backing mass is a cellular or foamed material.
- 30 19. A rod assembly embedded in matrix material as claimed in any of
claims 12 to 18 which is in the form of a shaped article.
20. A rod assembly embedded in matrix material as claimed in any of
claims 10 to 18 which is in the form of a panel.